



A SYSTEMATIC APPROACH AND ITS APPLICATION TO THE DUTCH DAIRY FARMING INDUSTRY

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ABSTRACT

In this article, a systematic approach is suggested to identify unexplored opportunities and recommend a business model for sustainability for startups. Considering a particular sector, following the proposed approach, an entrepreneur should first determine the importance of the different areas which could be improved in that sector. Then the current performance of these areas is also evaluated. Subsequently, by an importance-performance analysis, an entrepreneur can obtain information on areas that can be improved but that are currently underperforming. These are the areas that can be considered as opportunities with high success rate by the entrepreneurs for being survival. The proposed approach is applied to the case of dairy farming in The Netherlands. Data is collected from a sample of top experts in this field and analyzed using best-worst method and importance-performance analysis. We found that, of the technological, social, and organizational areas in Dutch dairy farming, the social area is the one area where the performance does not reflect its importance. Following the business model for sustainability, the entrepreneurs are advised to adopt archetypes that are suitable for the social area.

I. INTRODUCTION

ENTREPRENEURS have to make a number of important decisions when starting a business and trying to make it successful [82]. The decisions in question have to do with assessing the opportunity, which involves opportunity recognition evaluation, and exploitation [38]. Opportunity recognition is closely related to the design of a business model, which is a conceptual tool that shows how a business works in practice by including various aspects, such as potential customers, suppliers, partners and financial resources [82]. [93].

Due to environmental concerns, a new version of a business model has emerged in the form of the "business model for sustainability." Sustainability is a relatively new area that first emerged less than 20 years ago [32]. In recent years, by increasing the importance of sustainability, entrepreneurs have been looking for different ways to survive in a competitive environment while applying business models for sustainability [111]. The main features of business models for sustainability involve taking into account and resolving social and environmental issues [42]. Teece [109] states that "the essence of a



business model is in defining the manner by which the enterprise delivers value to customers, entices customers to pay for value, and converts those payments to profit." It is clear that the main function of a business model is to create and capture value. As such, in a business model for sustainability, the aim is to generate social and environmental values in addition to generating a viable profit [42].

In existing literature, several researchers have worked on business models for sustainability, including Bocken et al. [20]. Joyce and Paquin [66]. Yang et al. [118]. Evans et al. [47], and Bocken et al. [19]. However, identifying the unique business opportunities is not easy and entrepreneurs need to be able to spot changes in technology, markets and demographics and to establish a connection between those changes [11]. Moreover, actively searching for information and being alert, which involve the cognitive capacities of entrepreneurs [106], help them identify new solutions (such as new products/services) to satisfy the market and customers [11]. Several other factors have been recognized in literature as being essential to opportunity recognition, such as prior knowledge of a field or industry [75], [84], pattern recognition [11], [12], locus of control [8], social forces (eg, institutions, social networks and the entrepreneur's cognitive frames) [17] the innovative capabilities and opportunity recognition skills [68]. While several studies have examined opportunity recognition in traditional entrepreneurship: few researchers have so far focused on

opportunity recognition within the sustainable context [58].

While earlier studies have added much to our knowledge of opportunity recognition, they do not, generally speaking, address the following fundamental questions.

In fact, entrepreneurs have to adopt a systematic approach to opportunity recognition beyond what has been studied so far if they are to increase their chances of survival. In fact, we need to adopt a systematic structure to identify and develop reliable, valid, and distinct measures to discover and prioritize unexplored opportunities, with the ultimate aim of designing a business model. Moreover, by increasing the importance of sustainability, adoption of this systematic structure for opportunity recognition in the context of sustainability has become more vital for the entrepreneurs.

To fill this research gap, the main contribution of this article involves the development of a systematic approach in sustainable context to help entrepreneurs identify the most important areas in their sector which, based on their existing performance, need to be improved and finally increase their chance of survival. Opportunity recognition is not only the first part of the entrepreneurial process [61], it has also been identified as one of the key factors for a business survival [95]. In fact, the approach proposed in this article allows entrepreneurs to assess the opportunities in question and design a business model with a greater chance of success. In other words, opportunity recognition is connected to the



importance and performance levels of different factors in a specific sector. This article emphasizes that evaluating the opportunities should be considered at the beginning of design process of a business model, which has not thus far been considered in existing literature.

The major areas involve technological, social and organizational factors, which are the core elements of a business model for sustainability [20]. More precisely, the entrepreneurs in question have to collect information and identify the strategic areas that need to be improved within the particular sector in which they want to launch their business. Shepherd and Levesque [107] argued that entrepreneurs after recognition of an opportunity, should make a decision on collecting more information on the attractiveness of the opportunity. However, although this step is essential, it does not guarantee the success of a business, because an important area in which the firm in question already performs well may not be a smart investment choice. We need to go further. Therefore, after determining what the important improvement areas are, we have to examine their current performance, which leads us to propose an importance-performance analysis to identify the areas that have a greater potential for success (high importance combined with low performance). As such, in this article, we combine the business model for sustainability proposed by Bocken et al. [20] with importance-performance analysis, as developed by Martilla and James [80], to increase the chance of success of a business

survival. In this article, the model proposed by Bocken et al. [20] is used among other business models for sustainability (see, for instance, Gauthier, and Gilomen [52]; Lüdeke-Freund et al. [79]), because it addresses different ecological, social, and organizational issues, and provides more a complete view for a business model in a sustainable context. In other words, by reducing economic and environmental costs and focusing more on social and environmental aspects, this model addresses one of the main challenges in designing business models. Finally, we apply the proposed systematic approach to the agrifood industry in The Netherlands, one of the country's major economic sectors and, due to its features, an excellent candidate for entrepreneurs willing to invest in business models for sustainability.

The rest of this article is organized as follows. In Section II, we review the existing literature on opportunity recognition, as well as literature on business models for sustainability. In Section III, we propose a systematic approach for opportunity recognition. In Section IV, we apply the proposed systematic approach to Dutch dairy farming. In this section, data is collected from a sample of experts and analyzed using best-worst method (BWM) and importance-performance analysis. Finally, Section V concludes this article.

II. THEORETICAL BACKGROUND

We divide existing literature into two categories: opportunity recognition and business models for sustainability.



A. Opportunity Recognition

Opportunity recognition is a vital part of entrepreneurship that involves the identification and exploitation of profitable opportunities [58]. In the literature, four fundamental anchors for superior opportunities are identified [110]. The features of these anchors are: they create or add significant value for the customer or end-user: they do so by solving a significant problem, removing a serious pain point, or meeting a significant want or need; they have robust market. margin and money. making characteristics; and, finally, they have a good fit with the founder(s) and management team, along with an attractive risk-reward balance.

In addition to opportunity recognition, opportunity exploitation is one another main elements of this process [72]. Kuckertz et al. [72] defined the activities that are necessary for recognition of opportunity as: "being alert to potential business opportunities, actively searching for them, and gathering information about new ideas on products or services" while they defined the exploitation activities as "developing a product or service based on a perceived entrepreneurial opportunity, acquiring appropriate human resources, gathering financial resources, and setting up the organization." It is obvious that the first step in this process involves opportunity recognition, after which the opportunities that have been identified have to be exploited in practice. In this article, our main focus is on the first part of entrepreneurship process.

Sustainable entrepreneurs want to create not only financial value, but also environmental and social values by addressing a triple bottom line [46]. As such, for sustainable entrepreneurs, opportunity recognition involves the creation of future products and services that are environmentally and socially sustainable [96].

It may be clear that, to study opportunity recognition within the context of sustainability, we need a framework that combines a financial perspective with a social and environmental perspective, an area on which, so far, few studies have focused [58]. Patzelt and Shepherd [96] proposed a conceptual model for opportunity recognition in a sustainability-related context. Their model contains four main elements: prior knowledge of natural and communal (social) environment; perception of threat of the natural and communal (social) environment: altruism toward others; and entrepreneurial knowledge (as a moderator variable). Using the model proposed by [96] in an empirical context, Choongo et al. [31] were unable to find adequate empirical support. Hanohov and Baldacchino [58] also empirically tested the Patzelt and Shepherd [96] model, to improve the understanding of how sustainable entrepreneurs recognize opportunities. They advise sustainable entrepreneurs to be alert with regard to changing social, environmental and economic trends. Moreover, it is essential for the sustainable entrepreneurs to increase their knowledge on natural and communal environments, for instance via newspapers and the Internet, and to access first-hand information by



traveling abroad and be in a direct contact with the new society and environment.

So far, the literature has identified some factors that help entrepreneurs recognize sustainable opportunities. However, it is unclear how they can apply them in practice [57] and there is no structured framework for increasing the chance of success. In this article, we develop a framework that can support business model design taking ecological values into account, by focusing on opportunity recognition and how these values should be incorporated in such a design.

B. Business Model for Sustainability

The concept of business model was first mentioned in a scientific article about how it is possible to construct a multistage, multiperson business game in 1957 [16]. They used business model terminology to simulate a real-world situation using a model. The term business model was not used in scientific articles for decades, until the 1990s, when, with the development of information system and emerging Internet companies, the term gained attention among practitioners and business scholars [27], [60]. In fact, as there was no history of the performance of Internet companies, to determine the success of these companies, investors used their business model [37]. In the early 2000s, the use of business models had also expanded in other areas, like marketing, strategic and innovation management [37]. In the last ten years, the literature involving business models

has expanded rapidly, focusing initially on definitions, components and elements, ontologies and concepts (e.g. [4], [45], [90]), and more recently on business models and strategy [29], [109], [119], and on business model design and tooling for innovating and redesigning services [27], [40]. In other words, the focus with regard to business models has shifted from a conceptual and theoretical focus, to tooling and practical usability. More precisely, the focus has moved from understanding the concept to designing and implementing business models [27] and how a business model can be viable in the long run by capturing value for all the actors involved [41]. However, in reality, designing, innovating, exploring and implementing business models is a complex affair. More precisely, since each business actor comes from a different industry, with its own strategic interest, creating values for business actors can be complicated [41]. Some issues regarding the design of business model are related to organizational issues, such as partner selection and financial issues [39] [90]. Opportunity recognition, which is linked to business model design, also has a significant impact on the success of a business [82]. These design issues affect the performance of business models and ultimately are related to their success [39], [41].

Business model tools help make business model research usable in practice by visualizing business model components [26]. Bouwman et al. [26] defined the business model tooling as "the use of methods, frameworks or templates (here referred to as tools) to facilitate



communication and collaboration regarding business model analysis, (re-)design, adoption, implementation and exploitation." These tools include business model canvas [90], more computer-based tools, such as E-value methodology [53], business model design toolbox [48], and the business model modeling language (BM²L) [92].

A business model has several components, such as innovation, the actors involved and their relationships, and many researchers, such as Alt and Zimmermann [5], and Osterwalder and Pigneur [90]. Osterwalder and Pigneur [91], have studied these components. According to Osterwalder and Pigneur [91], a business model contains a number of components: value proposition (contains service/products, customer segment and relationships), value creation and delivery (refers to key activities, resources, channels, partners, and technology), and value capturing (refers to cost structure and revenue streams). The main aims of a business model are to realize greater profit and meet the economic objectives involved.

Recently, some multicriteria decision-making (MCDM) methods, such as (Fuzzy) AHP have been used as business model decision-making tools to evaluate the business model components and to select the business model (see, for instance, [36], [115]).

Both businesses and consultants embraced Osterwalder and Pigneur's [91] Business Model Canvas ontology, and as a result, business models were adapted in various industries [4]. It is important to note that

attention to business model components is different among different industries. For example, in manufacturing, the focus is more on the manufacturers' value networks, as they operate in a tight supply chain system, while telecommunication providers pay more attention to their value architectures as the primary enablers of value propositions [4].

Focusing only on realizing a profit, without paying attention to social and environmental issues can have a negative impact on a firm's ability to meet all of its economic goals [104]. As such, some alternatives are introduced that, in contrast to the traditional business models, have a greater focus on social and environmental issues. One of these alternative models is the "business model for sustainability" [113].

Recently, there has been more attention to sustainability-related issues. However, research into business models for sustainability compared to more generic business model literature, is very limited and relatively recent. Conceptually speaking, there is a difference between a "sustainable business model" and a "business model for sustainability." A sustainable business model is related to the different uncertainties in a business's future environment for a business. Here, the attention is on having a business model that is robust to uncertainties in the environment of the firm [56] Haaker et al. [56] proposes an approach to evaluate the robustness of a business model component. A business model that attempts to support both economic values and corporate social responsibility-related values, including social and environmental



aspects, is related to business model for sustainability [9], which is the focus of this article. In the last ten years or so, remarkable progress has been made

in business model for sustainability (see, for instance, Stubbs and Cocklin [108], Schaltegger et al. [105]; Boons et al. [25]; [24]). The concept of business model for sustainability has been related to business models in different areas, such as sharing economies (e.g., car sharing systems (Jorge and Correia [65]; Cohen and Kietzmann [33]; Munzel et al. [87]), energy prosumers (e.g., energy cooperatives (Huijben and Verbong [63]), energy efficiency [52], fishing cooperatives [67], product-service systems [6], [30], frugal innovation [76], social innovation [24], user-driven innovation [10], sufficiency in consumption [18] and sustainable procurement [117].

To realize long-term sustainability, we need fundamental changes in the industrial systems that actually transcend the economic aspects [120]. According to Azapagic [9], integrating sustainability in the organization structure requires an appropriate management framework including a proper vision, commitment and leadership. In fact, a business model for sustainability is based on triple bottom line approach and takes the interests of all stakeholders into account and delivers the environmental and social benefits [74], [108]

Making some fundamental changes in the purpose of business (re-conceptualizing the purpose), the way it is conducted and rethinking on creation of sustainable values are necessary to have a business model for

sustainability [20]. Therefore, redesigning the business model is essential to integrate the sustainability into the business model [97]. In fact, the three business model elements mentioned above (value proposition, value creation and delivery, and value capture) in combination of social and environmental perspectives lead to a business model for sustainability. Barth et al. [13] proposed another element to the three mentioned elements of a business model for having a business model for sustainability which is called value intention which focuses on considering the social and environmental aspects in the model.

Bocken et al. [20] suggested eight archetypes for the business model for sustainability. They defined the main business model innovation through three areas: technological, social, and organizational. Fig. 1 contains the eight archetypes that Bocken et al. [20] offered. As can be seen in this figure, this model emphasizes on translating social and environmental value creation into economic profits by decreasing economical cost. In fact, Bocken et al. [20] model is a way to answer one of the main challenges in designing business models. This challenge is enabling the firm to capture economic value for itself through delivering social and environmental benefits Schaltegger et al. [105]. As such, the main aim of the model proposed by Bocken et al. [20] is reducing economic and environmental cost by focusing more on social and environmental aspects

In this article, we use the model proposed by Bocken et al. [20] to identify the



improvement areas and then, in combination with importance performance analysis, increase the success of entrepreneurs Ulvenblad et al. [113] also used that model to examine which of the eight archetypes are used by Swedish food producers.

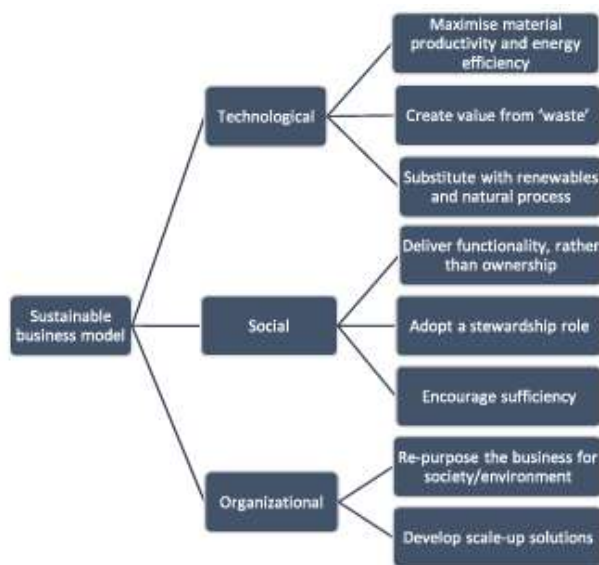


Fig. 1. Archetypes of business model for sustainability (adopted from [20]).

More precisely, we ask the experts for their opinion on the "importance" of improvements in a particular sector with respect to the three areas: social, technological and organization. The meaning of importance here is to identify priorities on which to focus. If an expert gives a higher importance rating to a technological aspect, they think that focusing on "technological" aspects compared to social and organization aspects has a higher potential for improvement in that sector, implying that an entrepreneur has a higher chance of being successful in that sector if that entrepreneur focuses more on technological aspects. It is worth to note that all these aspects and their related archetypes are ones which can be influenced

by an entrepreneur and they are in control of an entrepreneur.

In the model proposed by Bocken et al. [20], the technical area refers to the technical innovation component such as manufacturing process and product redesign, the social area relates to the social innovation component such as innovations in consumer offering, changing consumer behavior and finally. the organizational area contains the organizational innovation change component such as changing the fiduciary responsibility of the firm. Table I gives descriptions of eight archetypes of Bocken et al.'s [20] model.

The aim of Bocken et al.'s [20] model is to take social and environmental aspects into account and reduce the economic costs. Below, we explain how this aim can be reached by taking each of eight archetypes into account.

1) Maximize material productivity and energy efficiency leads to reducing the costs through the optimized use of materials, while reducing waste and compliance leads to increased profits and competitive pricing advantage Moreover, it contributes positively to society and environment through minimizing the environmental footprint.

2) Create value from "waste" leads to reducing economics and environmental costs through reusing material and turning waste into value. Moreover, it contributes positively to society and environment through reducing foot- print, waste and virgin materials use.



3) Substitute with renewables and natural process leads to generating revenue related to new products and services. Reducing the use of nonrenewable resources, emissions associated with burning fossil fuels and synthetic waste to landfill, value for the environment is captured.

4) Deliver functionality rather than ownership leads to consumers paying for using the service, not for owning products. Cost of ownership of physical products is borne by the company and/or partners. This can allow customers to access previously

expensive products, so expanding the market potential of new innovations.

III. SYSTEMATIC APPROACH TO PRIORITIZE OPPORTUNITIES

In this section, we propose a systematic approach which can be used to find opportunities in a particular sector. The proposed approach is generic and can be used in different sectors.

TABLE I
DESCRIPTIONS ON EIGHT ARCHETYPES OF BOCKEN ET AL. [20] MODEL

Areas	Sustainable Business Model Archetypes	Descriptions and examples
Technological	Maximize material productivity and energy efficiency	Using fewer resources, making and generating fewer waste, pollution and emissions, such as lean manufacturing.
	Create value from 'waste'	Removing of life cycle waste, closing material loops, and making better use of underutilized capacity, such as circular economy and closed loop.
Social	Substitute with renewables and natural process	Reducing the environmental impact and increasing business resilience by addressing resource constraints associated with renewable resources and current production systems, such as substitution with renewable (non-finite) resources
	Deliver functionality, rather than ownership	Providing services that satisfy the users' needs without having to own the physical products, such as rental, lease, shared.
	Adopt a stewardship role	Pro-actively engage with all stakeholders to promote their long-term health and well-being, such as ethical trade
Organizational	Encourage sufficiency	Investigating solutions that lead to reduce consumption and waste and using production longer, such as customer education
	Re-purpose the business for society/environment	Prioritizing delivery of social and environmental benefits rather than economic profit (i.e. shareholder value) maximization, through close integration between the firm and local communities and other stakeholder groups. The traditional business model where the customer is the primary beneficiary may shift, such as non-profit organization
	Develop scale-up solutions	Maximizing benefits for society and environment by delivering sustainable solutions in a large scale, such as franchising and licensing

C. Step 3. Find the Performance of the Sector With Respect to the Improvement Areas

The performance of the three areas (technological, social and organizational) and eight archetypes in the sector needs to be evaluated using existing databases or experts. Usually, such data at sector level is



not available and we have to rely on expert opinions

D. Step 4. Conduct an Importance-Performance Analysis

Having identified the importance of the development areas (step 21, and their current performance (step 3), we conducted an importance-performance analysis, In this article, we borrow the importance-performance analysis from marketing literature, which was initially proposed by Martilla and James [80]. Importance-performance analysis is easy to interpret based on 2-D grid to support managers to develop marketing strategies and make their strategic marketing decision useful. In fact, this framework (see Fig. 2) is developed to evaluate consumer acceptance of a marketing program based on identifying the aspect of marketing that firm should focus more and also the areas that may be consuming too many resources.

1) Quadrant A (Concentrate Here). The competitive capabilities in this quadrant are considered very important. However, the performance levels are very low, which means that improvement efforts should be concentrated here. As such, based on the aim of the article, this quadrant is the best place for the entrepreneurs to focus when making their business model. This quadrant represents key areas that need to be improved with top priority.

2) Quadrant B (Keep up the Good Work): Here, the competitive capabilities are perceived to be very important as well as the performance level of industry for these

activities. So, it would appear that in such a situation there is not any good opportunity for the entrepreneurs to invest time and energy as this area has already gotten enough attention.

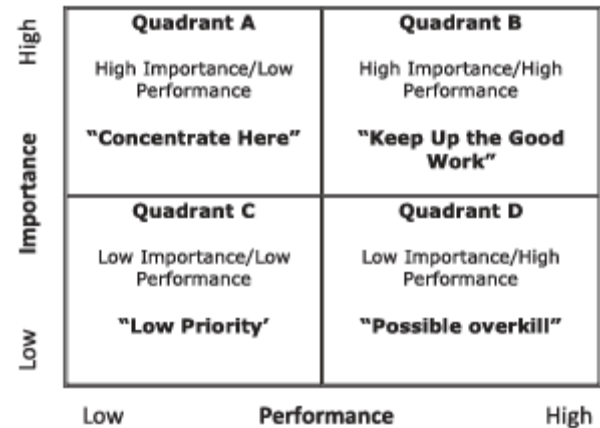


Fig. 2 Importance-performance grid (adopted from [80]).

IV. IMPLEMENTING THE PROPOSED APPROACH IN THE DUTCH AGRIFOOD SECTOR

A. Consider a Sector and a Product/Service (Step 1)

In order to demonstrate the feasibility of the proposed approach, we need to consider a sector. In this article, we examined agrifood producers in The Netherlands, with a main focus on the dairy sector. The livestock sector consists of different parts, such as dairy, pig, and poultry farming. However, we focus on Dutch dairy farming. We conducted a single case study to explore in greater detail those areas that need to be improved in dairy farming and look at them as business opportunities for the entrepreneurs who want to be active in different parts of the dairy farming value chain as supplier, producer, dairy processor.



etc. Conducting an in-depth study of individual cases has the potential to generate a new line of research [49].

There are several reasons that make dairy farming unique in comparison to other agricultural sectors.

- 1) Milk is a product that is produced every day and can be considered as a continuous source of revenue for the producers [44].
- 2) Human population growth has increased demand for dairy products.
- 3) The risk of labor injury and illness are high in this sector.

In all, new challenges involving food safety and a safe working environment for the dairy workforce and increased market competition among dairy producers put pressure on the sector to move toward more sustainable systems and we believe that applying the approach proposed in this article may help the Dutch dairy sector embark on a sustainable transformation.

B. Find the Most Important Improvement Areas (Step 2)

The BWM method has been applied to a number of problems involving sustainability, such as assessing the social sustainability in supply chains ([3]. [73]: [55][1], [2]), sustainability and technology selection [71], sustainability in manufacturing 1881. life cycle sustainability assessment [99], sustainability in location selection problem [69] [70], sustainability barriers in the manufacturing sector 15-11.

For more information on the procedure of BWM, see Appendix A.

1) Data Collection: The unit of analysis is made up of the three areas (criteria) of the business model for sustainability (technological, social, and organizational), based on the model proposed by Bocken et al. [20] and to learn about this unit of analysis and to answer the main research question, we collected data from the two expert groups in dairy farming in The Netherlands. These two expert groups are used as the unit of observation for this article.

The first group in this article comes from the academic and research institutes in The Netherlands. More precisely, the members of this group have an academic background and extensive research experience in the area of dairy farming. The second group comes from the dairy companies in The Netherlands which means they have a more direct contact with the farmers and other actors in the sector. Adopting this approach and collecting the opinions of these two groups gave us a more comprehensive picture of dairy farming sector in The Netherlands. When we invited the respondents for the interview by e-mail,

for data quality control before starting the interview, we sent the respondents a full description of three (improvement) areas of business model and archetypes (extracted from Bocken et al. [20] and Ulvenblad et al. [113]), and asked them to read the information carefully before taking part in the online interview, to make sure they all had the same understanding of the



improvement areas and archetypes. The online interviews, conducted using video calls, each lasted about 40 min. The questions were based on the guidelines of BWM and, at the start of each interview, the respondent received some information about the interview structure and was then asked to provide some personal information. Next, the respondent was asked to determine which business model areas (technological, social and organizational) would be the most and least important in terms of making

improvements in dairy farming in the Netherlands. after which the respondent was asked to compare the other areas to those two areas using the BWM procedure, by assigning a number between 1 and 9. The respondent followed the same structure for comparing archetypes as well. To measure the current performance of the Dutch dairy farming, the respondent was asked to rate the performance level of dairy farming based on each archetype on a scale of 1 (very low) to 5 (very high).

TABLE II
DETAILED INFORMATION REGARDING THE 22 EXPERTS

Experts from academic and research institutes in The Netherlands	Experts from dairy companies in The Netherlands
<ul style="list-style-type: none"> • Researcher at university with more than 12 years' experience in this field. • Researcher at university with more than 15 years' experience in this field. • Researcher at university with more than 15 years' experience in this field. • Researcher at university with more than 20 years' experience in this field. • Researcher at university with more than 30 years' experience in this field. • Researcher at university with more than 18 years' experience in this field. • Researcher at university with more than 17 years' experience in this field. • Researcher at university with more than 25 years' experience in this field. • Researcher at university with more than 27 years' experience in this field. • Researcher at university with more than 30 years' experience in this field. 	<ul style="list-style-type: none"> • Operations manager and farm owner in the dairy sector with more than 17 years' experience in this field. • Manager of a dairy company with more than 29 years' experience in this field. • Manager and coordinator of a dairy company with more than 25 years' experience in this field. • Managing director of a dairy company with more than 9 years' experience in this field. • CEO of a dairy company with more than 25 years' experience in this field. • Project manager of a dairy company with more than 25 years' experience in this field. • Program manager in dairy project of a dairy organization with more than 23 years' experience in this field. • Product manager and team leader of a dairy company with more than 22 years' experience in this field. • Advisor in several private consultancy companies and policy advisor in Ministry of Agriculture, Nature and Food Quality in The Netherlands with more than 40 years' experience in this field. • Corporate director dairy development and milk flows with more than 16 years' experience in this field. • Manager of research and development of a dairy company with more than 30 years' experience in this field. • Policy maker and advisor of a dairy company with more than 30 years' experience in this field.

This result is in line with what other researchers on sustain- ability in the area of

dairy farming has found (see for instance [23] and [86]. Social sustainability-related



aspects in dairy farming, especially Dutch dairy farming, have been studied far less than the economic and environmental aspects and deserve more attention. This area is quite a new research area in animal science, so there is limited knowledge. More importantly, people's (consumers') concerns on the social aspects of dairy farming have increased in recent years [23].

After seeing the results of the article, one of the experts mentioned that: "At first sight, the results meet my expectations. For centuries now, the dairy industry has successfully focused on technological and

organizational excellence. However, when public values like climate conditions, societal health and animal welfare come into play, it sounds logical that, nowadays, the social area deserves more attention. Current growing market initiatives like on the way to planet proof and better life labeling are good examples of this social entrepreneurship." We also received the following feedback from another expert: "Nice to see it confirmed that the social area is the most important one to improve, as technological and organizational areas have probably received most attention in the past decades."

TABLE III
RELATIVE WEIGHTS OF CRITERIA AND SUBCRITERIA

Areas (criteria)	Area's weight	Archetypes (sub-criteria)	Local weights of archetypes	Global weights of archetypes ^a
Technological	0.315	Maximize material productivity and energy efficiency	0.414	0.130
		Create value from 'waste'	0.247	0.077
		Substitute with renewables and natural process	0.339	0.106
Social	0.449	Deliver functionality rather than ownership	0.163	0.073
		Adopt a stewardship role	0.603	0.270
		Encourage sufficiency	0.234	0.105
Organizational	0.237	Re-purpose the business for society/environment	0.666	0.157
		Develop scale-up solutions	0.334	0.079

C. Find the Performance of the Sector With Respect to the Improvement Areas (Step 3)

The performance data of the eight archetypes in dairy farming in The Netherlands were also gathered from our

experts (the same 22 experts we used in step 2: see Table II). We asked the experts to assess the current performance of dairy farming in The Netherlands based on the various archetypes and on a scale from 1 (very low) to 5 (very high). Table IV gives



the mean values of the performance of the archetypes, along with the standard deviation, to show how far each performance value lies from the mean. As can be seen in the following table, the values are clustered close to the mean.

As we can see, the current performance of three archetypes of Social area (deliver functionality, rather than ownership, adopt a stewardship role and encourage sufficiency) is lower than that of the other archetypes in the Technological and Organizational areas.

V. CONCLUSION

This article proposes a framework to help entrepreneurs identify a proper area for investment and devise a sustainable business model, allowing them to recognize opportunities with a great potential of being successful. This framework makes it possible to evaluate different situations that may be potential opportunities with a high likelihood chance of success. Once the entrepreneur recognizes an opportunity, they use the proposed framework to determine whether there is any chance for success. If that was the case, they can design the business model based on that opportunity (idea). Moreover, in more complex situations, where the decision-making process was more challenging. for instance meeting different potential opportunities, the entrepreneur can evaluate them by following this proposed framework and, more specifically, conduct a performance-important analysis to select the one with the higher importance and lower performance. Choosing the opportunity that was more likely to succeed, saves money, energy and

time. Understanding the situation and performance-importance analysis was not only helpful and beneficial to the entrepreneur, but also to other stakeholders, like policy-makers, advisors and investors, allowing them to provide more valuable support to the entrepreneurs.

The framework proposed in this article was also important with regard to theory. Several business models for sustainability have been suggested in the literature. However, it was not always clear how those different models was useful to the entrepreneurs in practice. Using the framework proposed in this article allows entrepreneurs to use different areas of their business model to determine what the best area for investment is. Moreover, the importance of opportunity evaluation as a key step of designing the business model was not considered in existing literature As has been shown in this article, the performance-importance analysis was a proper tool to assess opportunities.

The framework in question was applied to this dairy farming sector in The Netherlands. More specifically, we wanted to find out which area in this sector still needs to be improved and as such can provide entrepreneurs with an opportunity. Three main areas were considered: technological, social; and organizational along with their assigned eight archetypes. We not only were to determine which areas and archetypes were the most important ones to be improved in the Dutch dairy farming, we also looked at their current performance applying an importance-performance analysis. This was a new approach to



recognize opportunities and increase the chance of entrepreneurs successfully launching their business.

Based on the information collected during interviews with 22 experts, we found that one of the main problems in implementing social aspects in dairy farming was that farmers are not completely convinced of the need to take social and environmental sustainability into account. In fact, they focus mainly on continuing their farming business, i.e., economic viability, rather than also considering the social and environmental issues. This problem become worse among older dairy farmers in comparison to young dairy farmers. The other important problems that were mentioned by the experts we consulted were a lack of open discussion and trust among consumers and farmers. All these problems make it difficult to realize sustainability and implement a suitable business model. The business model for sustainability proposed by Bocken et al. [20] does not take these important elements, which were related to the context of the industry, into account. In fact, as Boogaard et al. [23] mentioned, the social and cultural context influences the sociocultural sustainability of livestock farming. Therefore, for future research in this field, we recommend developing a model that includes contextual elements, such as the special characteristics of country, culture, or region.

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